Amendments to the Claims

1. **(Previously Presented)** A connection inspecting apparatus for inspecting connection of a connected part, said connection inspecting apparatus comprising:

an irradiation part for applying radiation to the connected part of members with an application condition being invariant;

a scintillator for converting the radiation passed through the connected part to a visible light;

an imaging device for picking up a plurality of transmission images of the connected part generated from said scintillator for a plurality of different storage times;

a sub-thickness image forming device for forming a plurality of sub-thickness images corresponding respectively to the plurality of transmission images of the plurality of different storage times supplied from said imaging device based on a relationship between a brightness density of the plurality of transmission images and a thickness of the connected part; and

a superimposed image forming device for forming a thickness superimposed image of the connected part by adding the plurality of the sub-thickness images to each other, wherein said superimposed image forming device forms the thickness superimposed image of the connected part by adding the plurality of sub-thickness images to each other when a value of the thickness of the connected part is within a certain range, and extracts and collects only valid parts of the plurality of sub-thickness images, respectively, so as to form the thickness superimposed image when the value of the thickness of the connected part is not within the certain range.

2. **(Canceled)**

3. **(Currently Amended)** The connection inspecting apparatus according to claim 1, wherein said sub-thickness image forming device forms a plurality of first sub-thickness images corresponding to the respective plurality of transmission images at the plurality of different storage times when one connected part is present along an application direction of the radiation, and forms a plurality of second sub-thickness images corresponding to each of the plurality of transmission images at the plurality of different storage times in a state with connected parts overlapping when

a plurality of connected parts are present overlapping in the application direction of the radiation, and

said superimposed image forming device forms a first ~~thickness~~ superimposed image by adding the plurality of first sub-thickness images to each other and also forms a second ~~thickness~~ superimposed image by adding the plurality of second sub-thickness images to each other, and subtracts the first ~~thickness~~ superimposed image from the second ~~thickness~~ superimposed image so as to form the thickness superimposed image.

4. **(Currently Amended)** The connection inspecting apparatus according to claim 3, wherein when the connected parts are present at opposite faces of a plate-shaped member, the first ~~thickness~~ superimposed image formed by said sub-thickness image forming device corresponds to the connected part at a first face of the opposite faces, and the second ~~thickness~~ superimposed image corresponds to the connected parts at both of the opposite faces, so that said superimposed image forming device obtains the thickness superimposed image of the connected part at a second face of the opposite faces by subtracting the first ~~thickness~~ superimposed image from the second ~~thickness~~ superimposed image.

5. **(Currently Amended)** The connection inspecting apparatus according to claim 3, wherein said superimposed image forming device extracts and collects only valid parts from the plurality of first sub-thickness images, respectively, so as to form the first ~~thickness~~ superimposed image, and extracts and collects only valid parts from the plurality of second sub-thickness images so as to form the second ~~thickness~~ superimposed image.

6. **(Previously Presented)** The connection inspecting apparatus according to claim 1, further comprising a teaching jig of a known thickness for obtaining the relationship between the brightness density of the plurality of transmission images and the thickness of the connected part, said teaching jig being formed of a material with a radiation transmittance equal to that of the connected part.

7. **(Currently Amended)** A connection inspecting method for inspecting a connected part, said connection inspecting method comprising:

applying radiation to the connected part of members with an application condition being invariant, and then converting the radiation passed through the connected part to visible light;

picking up a plurality of transmission images of the connected part expressed by the visible light for a plurality of different storage times;

forming a plurality of images corresponding respectively to the plurality of transmission images of the plurality of different storage times based on a relationship between a brightness density of the plurality of transmission images and a thickness of the connected part; and

forming a thickness superimposed image by adding the plurality of sub-thickness images to each other so as to inspect the connected part when a value of the thickness of the connected part is within a certain range, and forming the thickness superimposed image by extracting and ~~colleting~~ collecting only valid parts of the plurality of sub-thickness images, respectively, when the value of the thickness of the connected part is not within the certain range.

8. **(Cancelled)**

9. **(Previously Presented)** The connection inspecting method according to claim 7, wherein, when a plurality of connected parts are present overlapping in an application direction of the radiation, said forming of the plurality of sub-thickness images comprises:

forming a plurality of first sub-thickness images at the plurality of different storage times in a state where one connected part is present along the application direction of the radiation; and

forming a plurality of second sub-thickness images at the plurality of different storage times in a state where the plurality of connected parts are present overlapping in the application direction of the radiation, and

said forming of the thickness superimposed image comprises:

forming a first thickness superimposed image by adding the plurality of first sub-thickness images to each other, and forming a second thickness superimposed image by adding the plurality of second sub-thickness images to each other; and

subtracting the first thickness superimposed image from the second thickness superimposed image.

10. **(Currently Amended)** The connection inspecting method according to claim 9, wherein said forming of the first thickness superimposed image comprises extracting and collecting only valid parts from the plurality of first sub-thickness images, respectively, and said forming of the second thickness superimposed image comprises extracting and collecting only valid parts from the plurality of the second sub-thickness images.

11. **(Previously Presented)** A program on a computer readable recording medium to make a computer execute, said program comprising:

a process for applying radiation to a connected part of members with an application condition being invariant, and converting the radiation passed through the connected part to a visible light;

a process for picking up a plurality of transmission images of the connected part expressed by the visible light for a plurality of different storage times;

a process for forming sub-thickness images corresponding respectively to the plurality of transmission images of the plurality of different storage times based on a relationship between a brightness density of the plurality of transmission images and a thickness of the connected part; and

a process for adding the plurality of sub-thickness images to each other so as to form a thickness superimposed image when a value of the thickness of the connected part is within a certain range, and extracting and collecting only valid parts of the plurality of sub-thickness images, respectively, so as to form the thickness superimposed image when the value of the thickness of the connected part is not within the certain range.

12. **(Cancelled)**

13. **(Previously Presented)** The program according to claim 11, wherein when connected parts are present at opposite faces of a plate-shaped member,

said process of forming the sub-thickness image forms a plurality of first sub-thickness images corresponding to the plurality of transmission images at the plurality of storage times for the connected part present at a first face of the opposite faces, and forms a plurality of second sub-thickness images corresponding to the plurality of transmission images at the plurality of different storage times in a state where the connected parts are present overlapping at the opposite faces in an application direction of the radiation, and

said process of forming the thickness superimposed image forms a first thickness superimposed image by adding the plurality of first sub-thickness images to each other, forms a second thickness superimposed image by adding the plurality of second sub-thickness images to each other, and subtracts the first thickness superimposed image from the second thickness superimposed image so as to form the thickness superimposed image of the connected part present at a second face of the opposite faces.

14. **(Previously Presented)** A connection inspecting apparatus comprising:

an irradiation device for applying radiation to an object to be inspected having a first connection part and a second connection part;

a scintillator for converting the radiation passed through the object to visible light;

an imaging device for picking up a transmission image of the object generated from said scintillator; and

an image forming device for forming brightness information based on the transmission image supplied from said imaging device of the first connected part and the second connected part of the object to be inspected which overlap at an overlapping part in a thicknesswise direction thereof, and for forming an image of only the second connected part based on the brightness information.

15. **(Previously Presented)** The connection inspecting apparatus according to claim 14, wherein said image forming device binarizes the brightness information so as to form the image of only the second connected part by a bright side level (A+α) brighter than a reference brightness level

(A) of a transmission image of the first connected part when the object has only the first connected part and by a dark side level (A-β) darker than the reference brightness level.

16. **(Previously Presented)** The connection inspecting apparatus according to claim 15, wherein, based on an image of the first connected part and the second connected part overlapping obtained by binarizing the brightness information, an image of only the first connected part obtained by the binarization by the bright side level, and an image of the overlapping part obtained by the binarization by the dark side level, said image forming device deletes the image of only the first connected part from the image of the first and second connected parts, and adds the image of the overlapping part thereto so as to form the image of only the second connected part.

17. **(Previously Presented)** The connection inspecting apparatus according to claim 14, wherein said image forming device obtains outline position information of the first connected part based on the transmission image of the first connected part, and forms the image of only the second connected part based on the brightness information and the outline position information.

18. **(Previously Presented)** The connection inspecting apparatus according to claim 17, wherein said image forming device detects a brightness change at an outline position indicated by the outline position information by using the brightness information, obtains position information of a first position and a second position in an outline segment of the overlapping part showing a different brightness change from other positions, obtains information on a divide line passing the first position and the second position from the position information, and forms the image of only the second connected part from the brightness information by changing a binarization level at a first region including the first connected part and a second region including the second connected part which are divided by the divide line.

19. **(Previously Presented)** The connection inspecting apparatus according to claim 18, wherein the binarization level formed by said image forming device at the divided first region including the first connected part is a level for extracting only the overlapping part, while the

binarization level at the second region including the second connected part is a brightness level of the second connected part obtained when the position information of the first position and the second position is obtained.

20. **(Previously Presented)** The connection inspecting apparatus according to claim 18, wherein said image forming device obtains the position information of the first position and the second position based on a peak value of brightness.

21. **(Previously Presented)** The connection inspecting apparatus according to claim 14, wherein said imaging device picks up an image of the first connected part and the second connected part in an overlap state with a plurality of image storage times.

22. **(Previously Presented)** The connection inspecting apparatus according to claim 18, wherein said imaging device picks up an image of the first connected part and the second connected part in an overlap state with a plurality of different image storage times, and said image forming device obtains the first position and the second position in the outline segment of the overlapping part by using the brightness information of a largest brightness change among the brightness information of transmission images for every one of the plurality of different image storage times.

23. **(Previously Presented)** The connection inspecting apparatus according to claim 22, wherein said image forming device obtains the position information of the first position and the second position based on the brightness information of a largest peak value of brightness.

24. **(Previously Presented)** A connection inspecting method comprising:

applying a radiation to an object to be inspected which has a first connected part overlapping with a second connected part at an overlapping part in a thicknesswise direction of the object, and converting a the radiation passed through the object to visible light;

forming brightness information based on a transmission image of the first connected part and the second connected part in an overlap state which is obtained through the converting to the visible light; and

forming an image of only the second connected part based on the brightness information.

25. **(Previously Presented)** The connection inspecting method according to claim 24, wherein said forming of the image of only the second connected part comprises:

binarizing the brightness information so as to obtain an image of the first connected part and the second connected part in the overlap state;

binarizing the brightness information by a bright side level (A+α) brighter than a reference brightness level (A) at a transmission image of the first connected part when the object has only the first connected part so as to obtain an image of only the first connected part;

binarizing the brightness information by a dark side level (A-β) darker than the reference brightness level so as to obtain an image of the overlapping part; and

deleting the image of only the first connected part from the image of the first connected part and the second connected part, and adding the image of the overlapping part thereto, whereby the image of only the second connected part is formed.

26. **(Previously Presented)** The connection inspecting method according to claim 24, wherein said forming of the image of only the second connected part comprises:

obtaining outline position information of the first connected part based on a transmission image of the first connected part by using the brightness information;

detecting a brightness change at an outline position indicated by the outline position information;

obtaining position information of a first position and a second position in an outline segment of the overlapping part showing a different brightness change from other positions;

obtaining information on a divide line passing the first position and second position from the position information; and

binarizing for a first region including the first connected part divided by the divide line by a level in which only the overlapping part is extracted, and binarizing for a second region including the second connected part by a brightness level of the second connected part obtained when the position information of the first position and second position are obtained, so that the image of only the second connected part is formed from the brightness information.

27. **(Previously Presented)** The connection inspecting method according to claim 26, wherein the position information of the first position and second position are obtained based on a peak value of brightness.

28. **(Previously Presented)** The connection inspecting method according to claim 24, wherein the first connected part and the second connected part in the overlap state are picked up by a plurality of different image storage times.

29. **(Previously Presented)** A program on a computer readable recording medium to make a computer execute, said program comprising:

a process of applying a radiation to an object to be inspected which has a first connected part overlapping with a second connected part at an overlapping part in a thickness direction of the object;

a process of forming brightness information based on a transmission image of the first connected part and the second connected part in an overlap state which is obtained by converting a the radiation passed through the object to visible light; and

a process of forming an image of only the second connected part based on the brightness information.

30. **(Previously Presented)** The program according to claim 29, wherein said process of forming the image binarizes the brightness information so as to obtain an image of the first

connected part and the second connected part in the overlap state, binarizes the brightness information by a bright side level (A+α) brighter than a reference brightness level (A) at a transmission image of the first connected part when the object has only the first connected part so as to obtain an image of only the first connected part, binarizes the brightness information by a dark side level (A-β) darker than the reference brightness level so as to obtain an image of the overlapping part, and deletes the image of only the first connected part from the image of the first connected part and second connected part, and adds the image of the overlapping part thereto so as to form the image of only the second connected part.

31. **(Previously Presented)** The program according to claim 29, wherein said process of forming the image of only the second connected part obtains outline position information of the first connected part based on the transmission image of the first connected part with the use of the brightness information, detects a brightness change in an outline position indicated by the outline position information, obtains position information of a first position and a second position in an outline segment of the overlapping part showing a different brightness change from other positions, obtains information on a divide line passing the first position and the second position from the position information, binarizes a first region including the first connected part divided by the divide line by a level in which only the overlapping part is extracted, and binarizes a second region including the second connected part by a brightness level of the second connected part obtained when the position information of the first position and the second position are obtained, so that the image of only the second connected part is formed from the brightness information.

32. **(Previously Presented)** The program according to claim 29, wherein said process of forming the image of only the second connected part obtains outline position information of the first connected part based on an image of the first connected part by using the brightness information, detects a brightness peak value in an outline position indicated by the outline position information, obtains position information of a first position and a second position of an outline segment of the overlapping part by setting detected peaks as the first position and the second position, obtains information on a divide line passing the first position and the second position from the position

information, binarizes a first region including the first connected part divided by the divide line by a level in which only the overlapping part is extracted, and binarizes a second region including the second connected part by a brightness level of the second connected part obtained when the position information of the first position and the second position are obtained, so that the image of only the second connected part is formed from the brightness information.

33. **(Previously Presented)** The program to claim 29, wherein the brightness information is formed based on the transmission image of the first connected part and the second connected part in the overlap state by picking up the image of the first connected part and second connected part with a plurality of different image storage times.